



AGROCHEMICALS AND ITS ALTERNATIVE ASPECTS FOR SUSTAINABLE AGRICULTURE

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ABSTRACT

Agrochemicals such as pesticides, herbicides, insecticides, fungicides, and synthetic fertilizers are widely used in modern agriculture to increase crop productivity and control pests and diseases. However, excessive and improper use of these chemicals has led to several environmental and health-related problems. Agrochemicals contribute to soil degradation, nutrient imbalance, groundwater contamination, and toxicity to beneficial soil microorganisms. Residues in food products may also pose risks to human and animal health. These issues highlight the urgent need for more sustainable agricultural practices. Sustainable agriculture focuses on maintaining soil fertility, protecting ecosystems, and ensuring food security without compromising the needs of future generations. Alternative approaches such as organic farming, biofertilizers, vermicomposting, and other biotechnological tools can help reduce dependence on harmful chemicals. Biofertilizers enrich soil nutrients, support beneficial microbial activity, and promote eco-friendly crop production. Therefore, adopting sustainable agricultural practices and raising awareness among farmers and policymakers are essential for minimizing the negative impacts of agrochemicals while maintaining long-term agricultural productivity and environmental health.

FIGURES

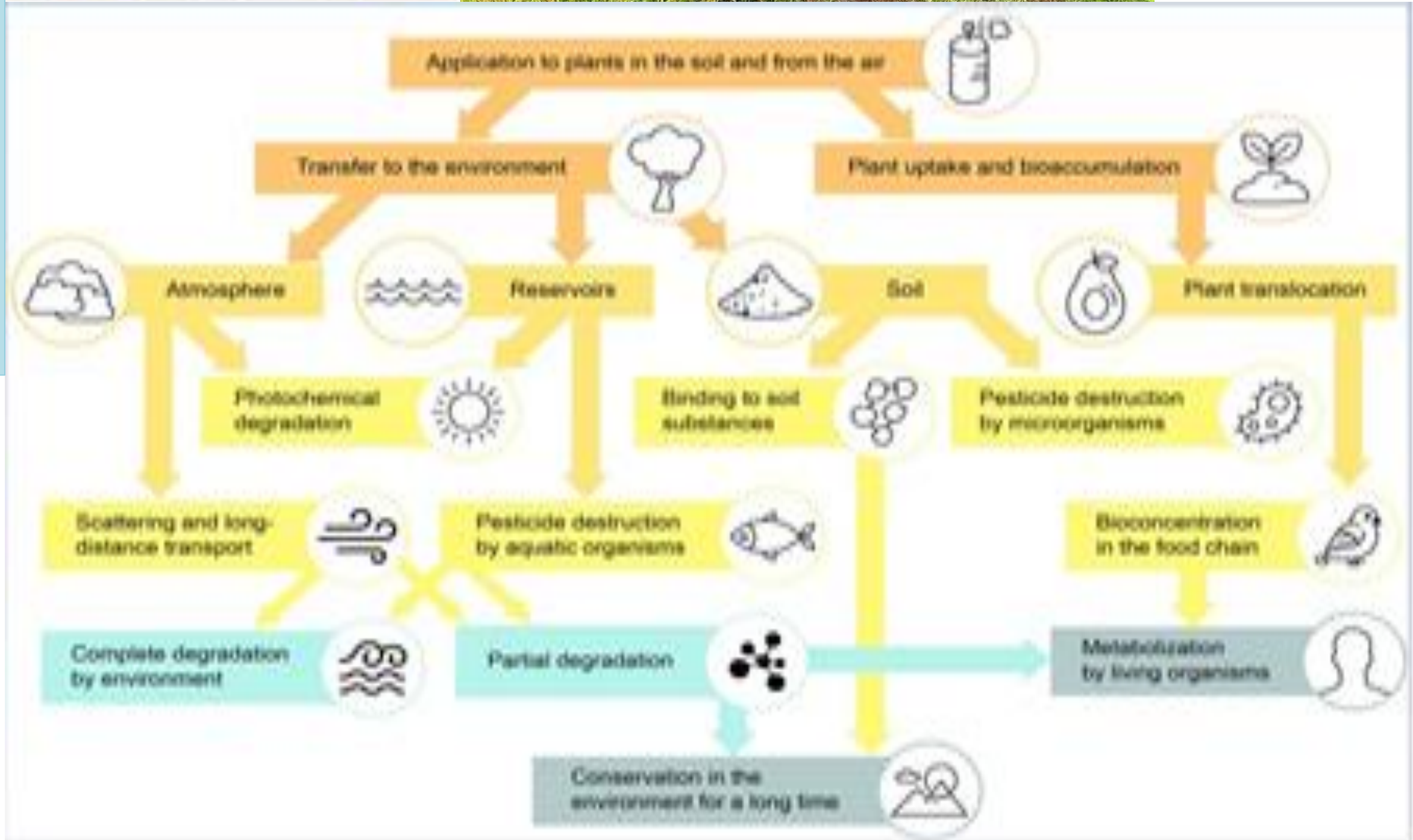
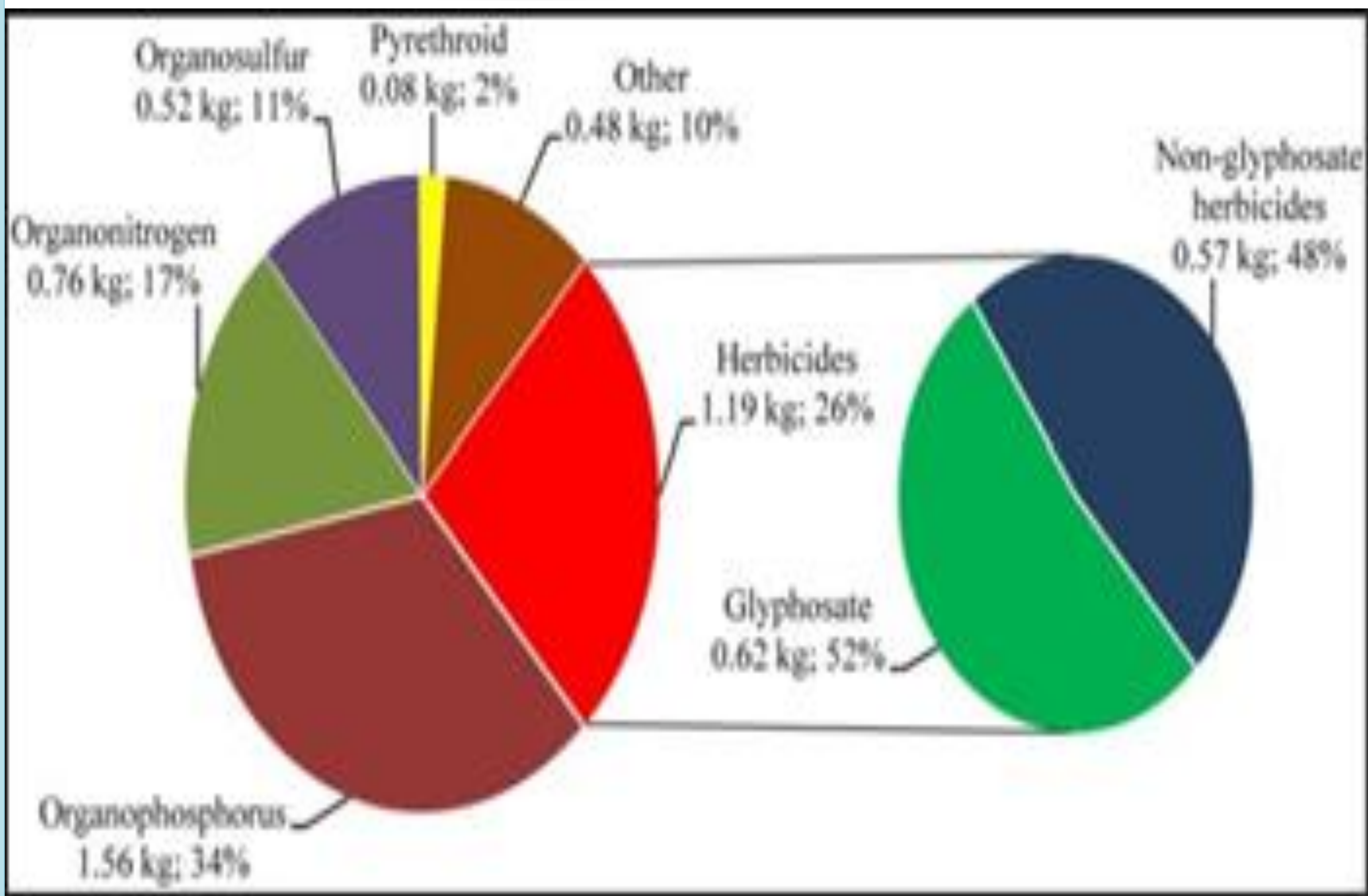


FIGURE: A schematic representation of agrochemicals transport route after application.

DISADVANTAGES OF AGROCHEMICALS:

- ❖ Environmental pollution
- ❖ Decrease soil fertility and nutrient imbalance
- ❖ Contamination of groundwater
- ❖ Alter food quality
- ❖ Residues effects on the human and animal health.
- ❖ Toxic to soil microorganisms

What are the agrochemicals ?

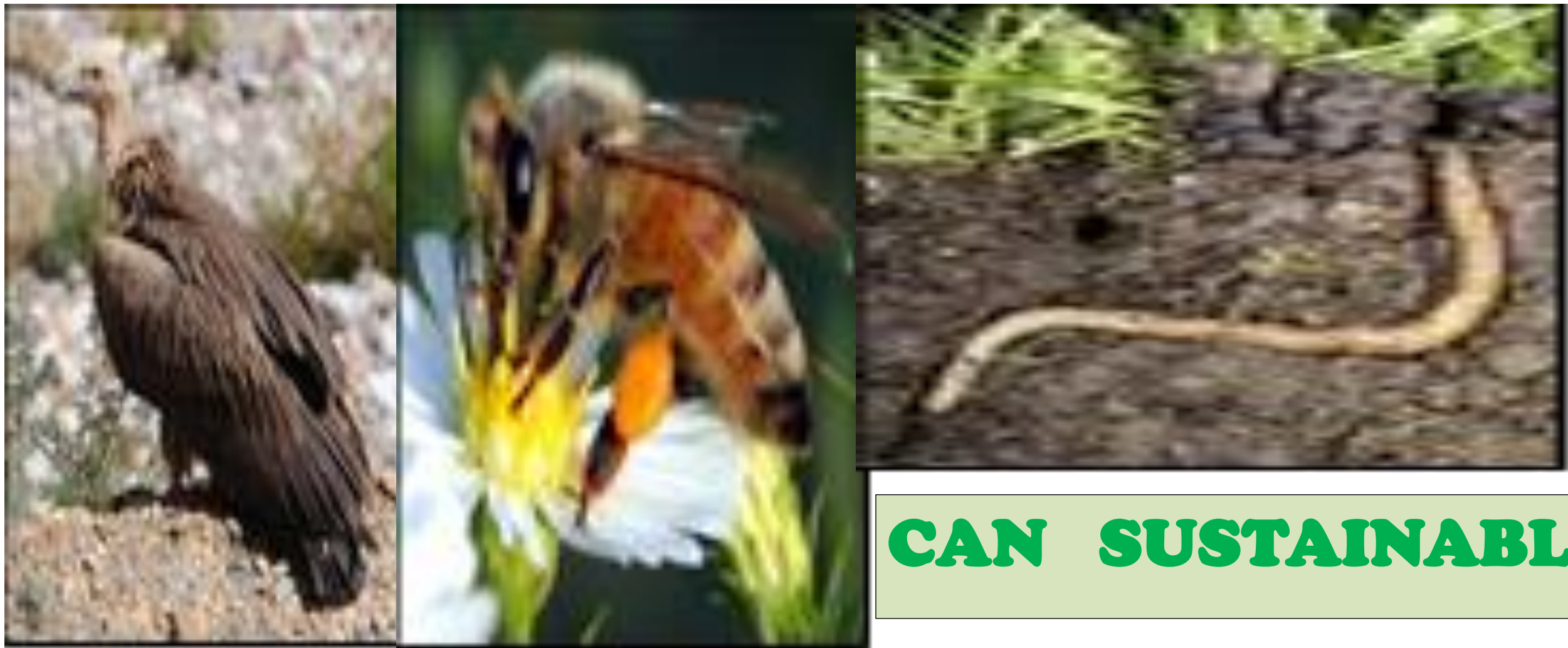
- Pesticides:**
Chlorpyrifos, Imidacloprid.
Herbicides:
Glyphosate, 2,4-D.
Insecticides:
Cypermethrin, Lambda- cyhalothrin.
Fungicides:
Carbendazim, Hexaconazole
Synthetic fertilizers:
Urea, Potassium chloride.



Figure: In 1970, Kerala started **ENDOSULFAN** spraying on Cashew plantation.

A review of the literature and data from **WHO** during the 2006-2018 period shows can estimate 385 million cases of poisoning and 11,000 fatalities annually among farmers across 141 countries.

STOP KILLING US, WE ARE ALSO PART OF FOOD WEB.



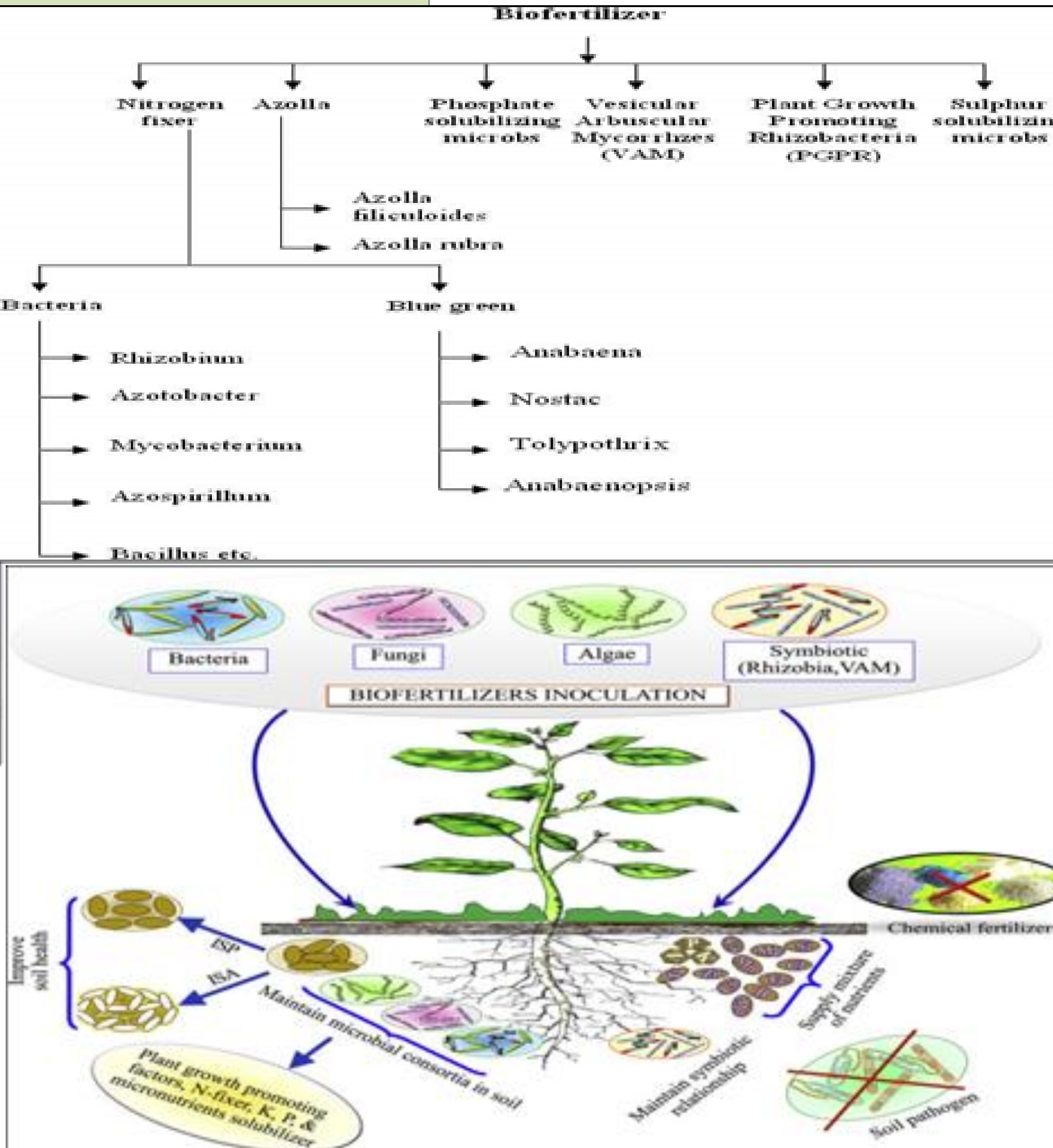
CAN SUSTAINABLE AGRICULTURE ATERNATE AGROCHEMICALS ?

What is sustainable agriculture ?

Sustainable agriculture is farming without compromising the ability for future generations to meet their needs.



CONCLUSION: Soil fertility is crucial for maintaining sustainable agricultural production and ensuring global food and nutritional security. To prevent the excessive use of pesticides by farmers, the scientific community, along with other agencies such as the government, NGOs, distributors, policymakers, and cooperative societies, should take initiatives to raise awareness among farmers about the negative effects of the overuse of agrochemicals. Instead, alternative approaches such as the use of biofertilizers and beneficial microbes should be promoted to support sustainable and environmentally friendly agriculture.



BIOTECHNOLOGICAL TOOLS FOR AGRICULTURAL ENHANCEMENT

ADVANTAGES OF BIOFERTILIZERS :

- ❖ Enrichment of soil
- ❖ It's harmless for plant
- ❖ Beneficial for soil microbes
- ❖ Protects natural fertility of soil
- ❖ Eco-friendly.

REFERENCE:

- Devi, P. I., Manjula, M., & Bhavani, R. V. (2022). Agrochemicals, environment, and human health. *Annual review of environment and resources*, 47(1), 399-421.
- Mahmud, A. A., Upadhyay, S. K., Srivastava, A. K., & Bhojiya, A. A. (2021). Biofertilizers: A Nexus between soil fertility and crop productivity under abiotic stress. *Current Research in Environmental Sustainability*, 3, 1-14.

If SIKKIM can, why don't ASSAM-?

